

Remarks

Claims 1-30 have been amended. Claim 1 has been amended to define abrasive articles rather than abrasive particles being claimed. Claim 1 includes the text of claim 31 which has been canceled. Claims 2-30 have been amended to define abrasive articles instead of abrasive particles. Claims 33-43 have been canceled. Claims 44, 45, 46 and 47 have been amended to depend from claim 1. Claim 48 has been amended to indicate that the method of abrading involves the use of the abrasive article of claim 1.

Claims 1-30, 32, 44-48 are submitted for reconsideration.

Claims 15-17 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 15 and 16 have been amended to include "further comprises" according to the suggestion of the Office Action.

Claims 35-40 were also rejected for being indefinite, but these claims have been canceled.

It is submitted that the Amendment obviates the rejection under 35 U.S.C. § 112.

Claims 1-25, 27-30, 33-42 and 48 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Kawanami, et al. (US Patent No. 5,409,415).

Kawanami, et al. disclose a shot method wherein the shot media comprises a composition based on zirconia composed of a sintered body of partially stabilized zirconia (Abstract). The composition of Kawanami, et al.'s particles may be the same as the composition of the abrasive grains of the present application. Kawanami, et al.'s disclosure does not describe abrasive products such as a coated abrasive product, a bonded abrasive product or a non-woven abrasive product which contain such shot media. Kawanami, et al., at column 8, lines 40-41 describe utilizing the shot particles for "polishing, grinding or blast cleaning." Such uses typically involve the utilization of loose particles rather than those contained in any sort of abrasive product. Present claims now define abrasive products which include abrasive particles wherein at least a portion of the abrasive particles comprises at least 60 percent by weight sintered, polycrystalline zirconium, based on the total weight of the abrasive particle.

In view of the above discussion, the rejection under 35 U.S.C. § 102 is no longer appropriate. Further, the rejection under 35 U.S.C. § 103(a) is no longer appropriate either because there is no suggestion in Kawanami, et al. of utilizing their shot media in any type of abrasive product.

Further, Applicants have demonstrated unexpected grinding performance when comparing a coated abrasive product including the abrasive grains with a comparative coated abrasive product, Example A, containing CUBITRON™ abrasive grains. The Examiner is invited to refer to Fig. 5 which shows an unexpected improvement in grinding performance after a significant amount of grinding time in the grinding performance of Example 1 as compared to the grinding performance of comparative Example A. The Examiner is invited to refer to pages 29 and 30 of the specification which describes the testing and the test results. Such unexpected performance in abrasive performance should obviate any rejection under 35 U.S.C. § 103(a).

Claims 26, 31, 32 and 43-47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawanami, et al. in view of Monroe (US Patent No. 4,770,671) and Johnson, et al. (US Patent No. 5,679,067). Such rejection is unwarranted. There is no suggestion in either of these references that one skilled in the art would place the shot media disclosed in Kawanami, et al. into any type of abrasive product.

Claims 1, 12-14, 25, 27-31, 33, 35-37, 42-43, 45 and 48 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Amero. This rejection is inappropriate because the range of zirconia in Amero's abrasive material "vary from below about 15% to as high as about 60%, although preferred ranges for both materials normally lie in the range of about 40% to about 60%" (column 2, lines 25-29). In contrast, abrasive particles defined in claim 1 of the present application require "at least 60.0% by weight sintered, polycrystalline zirconia, based on the total weight of the abrasive particle." Thus, the rejection is inappropriate. Further, claim 2 defines the zirconia content as being "at least 65.0%" with claims 3-7 defining compositions that contain 70.0% zirconia (claim 3), 75.0% zirconia (claim 4), 80.0% zirconia (claim 5), 85.0% zirconia (claim 6) and 90.0% zirconia (claim 7). Thus, Amero's disclosure is inappropriate to anticipate or render obvious Applicants' claimed invention.

Further, as discussed above, it has demonstrated unexpected performance advantages in coated abrasive products which contain the claimed abrasive granules.

The further rejection of claims 18-24, 26, 32, 44-47 under 35 U.S.C. 103(a) as being unpatentable over Amero in view of Monroe, et al. ('671) and Johnson, et al. ('067) is unwarranted and it should be withdrawn.

The claims have been amended to define abrasive articles that contain abrasive grains. Amero's abrasive grains contain almost 60% by weight zirconia whereas Applicants' particles contain at least 60 to about 97% by weight sintered polycrystalline zirconia (page 10, line 19).

Applicant has demonstrated unexpected performance advantages by utilization of the claimed abrasive particles discussed above.

It is submitted that the claims of the application are now in condition for allowance and such action is accordingly, earnestly solicited.

Respectfully submitted,

8/18/03
Date

By: Richard Francis
Richard Francis, Reg. No.: 25,393
Telephone No.: (651) 733-7519

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833